



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan
International
Institute of Technology
(MJIT)

Bachelor of Software Engineering

Session 2024/2025 Semester 1

SECR 1213 Network Communication

Section - 16

Lecturer: Dr. Kaiyisah Hanis Mohd Azmi

Task-4

Submitted by:

group 7

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Date of Submission: December 14, 2024

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Project Overview

This report outlines the detailed design and implementation plan for the network infrastructure of the designated floor plan. It includes precise device distribution, cabling paths, and lengths, based on CAD layout data and project requirements.

1. Work Area Identification

Work Area	Number of Devices	Network Ports	Wi-Fi APs
Embedded Lab	32	36	1
Lab 1	30	34	1
Lab 2	30	34	1
Lab 3	30	34	1
Classroom	30	34	1
Common Areas	-	-	4

2. Cabling Path and Length Analysis

2.1 Horizontal Cabling (Cat6)

Purpose: Connect end-user devices in labs, classroom, and common areas to the respective floor distribution switches (TR).

Work Area	Devices	Avg. Direct Path (m)	Wall/Corner Adjustment (m/device)	Total Length (m)
Embedded Lab	32	15	5	640
Lab 1	30	18	5	690
Lab 2	30	22	5	810
Lab 3	30	20	5	750
Classroom	30	25	5	900
Common Areas	4 APs	30	10	160

Total				3,950
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Additional Safety Margin: To account for future expansions and unforeseen adjustments, an additional 10% buffer is added to the horizontal cabling:

Buffer Length = $3,950 \times 10\% = 395$ meters.

Final Horizontal Cabling Length = 4,345 meters.

2.2 Vertical Cabling (OM4 Fiber)

Purpose: Connect the Main Distribution Facility (MDF) to the floor distribution switches (TR) on each floor.

Floor	Direct Path Length (m)	Wall Adjustment (m)	Total Length (m)
Embedded Lab	35	5	40
Labs 1, 2, 3	35	5	$40 \times 3 = 120$
Total			160

Additional Safety Margin:

Buffer Length = $160 \times 10\% = 16$ meters.

Final Vertical Cabling Length = 176 meters.

3. Device and Switch Requirements

3.1 Devices:

- Embedded Lab: 32 devices
- Other Labs: 30 devices each (3 labs)
- Classroom: 30 devices

3.2 Switches:

Switches are selected based on device density and future scalability:

Work Area	Required Switch Ports	Switch Model	Quantity
Embedded Lab	36	Cisco Catalyst 9200	1

		(48P)	
Labs 1, 2, 3	34 each	Cisco Catalyst 9200 (48P)	3
Classroom/Common	34	Cisco Catalyst 9200 (48P)	1
Total			5

4. Cost Analysis

4.1 Cabling Costs

Cabling Type	Unit Cost (RM)	Total Length (m)	Total Cost (RM)
Cat6 Horizontal	3/m	4,345	13,035
OM4 Vertical Fiber	15/m	176	2,640
Patch Cords	10/unit	182	1,820
Total Cabling			17,495

4.2 Switch Costs

Model	Unit Cost (RM)	Quantity	Total Cost (RM)
Cisco Catalyst 9200 (48P)	12,000	5	60,000

4.3 Wi-Fi AP Costs

Model	Unit Cost (RM)	Quantity	Total Cost (RM)
Cisco Catalyst 9100 AP	5,500	5	27,500

4.4 Total Project Cost

Component	Total Cost (RM)
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Cabling	17,495
Switches	60,000
Wi-Fi APs	27,500
Grand Total	104,995

5. Annotated Floor Plan

Below is the annotated floor plan indicating:

Locations of labs, classroom, and common areas.

Cabling paths and approximate lengths.

Device placements and TR/MDF connections.



The first floor



The second floor

6. Meeting Notes

6.1.Meeting

DATE/TIME	November	10/12/ 2024	6:00PM
LOCATION	Zoom Virtual Meeting		
AGENDA	1. Discussion on cabling paths and lengths.		
	2.Confirmation of device placements.		
	3.Review of cost estimates and final adjustments.		
	4. Assignments for report preparation and submission.		
Meeting MC	Liu Wanpeng		

ATTENDANCE

NAME	TIME	REASON FOR ABSENCE
Liu Wanpeng	06:00	
Zhao Wei	06:01	
Thamer Alharbi	06:06	

MINUTES NO.

NO.	ITEM DISCUSSED	IDEAS/SUGGESTIONS AND PERSON GIVING IT	PERSON IN CHARGE & DATE
1	Cabling Paths and Lengths	Zhao Wei proposed including additional safety margins for cabling redundancy.	Zhao (12/12)
2	Device Placements	Liu Wanpeng suggested ensuring device alignment with CAD layout for accuracy.	Liu (11/12)
3	Cost Estimates and Adjustments	Thamer recommended a thorough recheck of budget alignment with equipment needs.	Thamer (12/12)
	Cost Estimates and Adjustments	Liu coordinated report drafting responsibilities among team members.	Liu (13/12)
	Meeting Ended	Meeting concluded at 7:00 PM.	

6.2. Member Rating

Liu Wanpeng

No.	Scoring Criteria	Score (1-5)
1	Host's Performance	5
2	Clarity of Agenda	4
3	Team Participation	4.5
4	Decision-Making Efficiency	4.5
5	Task Allocation	5
6	Overall score	5

Zhao Wei

No.	Scoring Criteria	Score (1-5)
1	Host's Performance	5
2	Clarity of Agenda	4.5
3	Team Participation	4.5
4	Decision-Making Efficiency	4
5	Task Allocation	5
6	Overall score	5

Thamer Alharbi

No.	Scoring Criteria	Score (1-5)
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1	Host's Performance	4.5
2	Clarity of Agenda	4
3	Team Participation	4
4	Decision-Making Efficiency	5
5	Task Allocation	3.5
6	Overall score	4.5

7. Summary

The network infrastructure plan aligns with CAD data and project requirements. Accurate cabling lengths and device distributions ensure cost-effective and scalable implementation. The design provides:

1. Robust connectivity across work areas.
2. Adequate redundancy for future scalability.
3. Secure Wi-Fi coverage in common areas.

Overview

